

Sex and occupational differences in long COVID prevalence among healthcare workers: a multicentre registry-based study in three Spanish hospitals

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Abstract

Aims

To estimate the prevalence of clinically diagnosed long COVID and examine associated occupational and demographic factors among healthcare workers (HCWs) in Spain using registry data of three hospitals.

Methods

A multicentre study was conducted between 2020 and 2023 in three Spanish hospitals (Madrid, n=1; Barcelona, n=2). Long COVID prevalence and 95% confidence intervals (CIs) were estimated overall and by sex, age group, and occupational category. Associations between long COVID and occupational category were assessed using Poisson regression models with robust variance, stratified by sex and adjusted for age and hospital.

Results

Registry data included 8,439 HCWs. Long COVID prevalence ranged from 3.0% to 5.0% and increased with age, with an adjusted prevalence ratio (PR) increase of 3-9% per year. Occupational differences were more pronounced among men. In University Hospital Ramon y Cajal, male nurses (PR 2.56; 95% CI 1.13–5.81) and other HCWs (PR 3.67; 95% CI 1.12–12.08) had higher prevalence compared with physicians. In Hospital Parc Tauli, male nurse assistants (PR 20.33; 95% CI 3.64–113.42) and support staff (PR 8.30; 95% CI 1.46–47.19) showed markedly elevated prevalence, although confidence intervals were wide. Among women, occupational associations were weaker and less consistent. Overall sex differences were modest, but sex modified the association between occupational role and long COVID prevalence.

Conclusions

Long COVID affected 3-5% of Spanish HCWs. Occupational role, particularly among men, was associated with long COVID prevalence, highlighting the need for occupational health surveillance and follow-up strategies that account for sex-specific patterns and differences in job roles.

Keywords: COVID-19, occupational health, post-covid, healthcare system

76 **Key Points**

77 *What is already known on this topic:* Healthcare workers have experienced high
78 occupational exposure to SARS-CoV-2, and previous studies report highly variable
79 estimates of long COVID prevalence, often focusing on physicians and nurses, with
80 inconsistent evidence regarding occupational and sex-related risk factors.

81 *What this study adds:* Using multicentre hospital registry data from Spain, this study
82 shows that approximately 5% of healthcare workers were clinically diagnosed with long
83 COVID. Long COVID prevalence varied by occupational category and age, and
84 occupational differences were more pronounced among men, indicating sex-specific
85 patterns in occupational risk.

86 *How this study might affect research, practice or policy:* These findings highlight the
87 importance of strengthening occupational health surveillance and follow-up for long
88 COVID across both clinical and non-clinical hospital roles and suggest that prevention
89 and return-to-work strategies should consider sex-specific and occupation-related
90 patterns of long COVID among healthcare workers.

Introduction

Six years after the start of the COVID-19 pandemic and with over 700 million confirmed cases worldwide(1), a substantial proportion of individuals who have been infected with SARS-CoV-2 continue to experience long-lasting symptoms that affect daily functioning and their ability to work(2). This condition, known as long COVID, is defined by the World Health Organization (WHO) as a “post-COVID-19 condition occurring usually three months after acute infection, with symptoms lasting at least two months and not explained by an alternative diagnosis. Common symptoms included fatigue, shortness of breath, cognitive dysfunction, but also others, and generally have an impact on everyday functioning”(3).

There has been increasing interest in the impact of long COVID on vulnerable populations and key occupational groups, particularly healthcare workers (HCWs), including both clinical and non-clinical staff. Globally, more than 8.9 million HCWs have been infected with SARS-CoV-2(4), often under conditions of sustained occupational exposure, raising concerns about an elevated risk of long COVID(5). A recent rapid review reported that many affected HCWs experience reduced capacity to perform everyday tasks, concerns about patient safety, and difficulties coping with workplace demands(6).

At the policy level, the occupational recognition of COVID-19 and long COVID among HCWs remains heterogeneous across Europe(7). Although the European Commission recommended recognising COVID-19 as an occupational disease in cases of workplace exposure, long COVID is not uniformly acknowledged. In Spain, COVID-19 (and long COVID) was classified as a work-related accident rather than an occupational disease, with adverse implications for access to long-term compensation as it only covers up to 5 years, difficulty to access workplace accommodations and occupational health follow-up (7–9).

Estimates of long COVID prevalence among HCWs vary widely, ranging from 15% to over 70%, depending on the study period, case definition, recruitment strategy and data collection method(10–23). In the general population, prevalence estimates are considerably lower, around 6%(24). Reported risk factors for long COVID among HCWs have been inconsistent, with several studies suggesting associations with female sex, older age(14,25), and greater severity of the acute infection(26,27), while evidence regarding occupational risk factors remains limited and heterogeneous. Some studies have reported higher risk among nurse assistants(18,19), but many investigations have focused primarily on physicians and nurses and have not consistently included non-clinical hospital staff(21,26).

Recent population-based evidence from Spain has highlighted the role of occupational determinants of long COVID, including close contact with colleagues and the public, limited opportunities for social distancing, and inadequate use of personal protective equipment at work (28). However, evidence specifically focusing on HCWs and based on

clinically diagnosed long COVID identified through routine hospital registry data remains scarce.

The primary aim of this study was to estimate the prevalence of clinically diagnosed long COVID among healthcare workers in three Spanish hospitals using registry-based data, and to examine its association with sociodemographic and occupational characteristics, including potential differences by sex.

Methods

Study design and setting

A multicentre study was conducted using hospital registry data from three public hospitals in Spain, recruited through the national research network Centre for Biomedical Research in Epidemiology and Public Health (CIBERESP). Participating centres included University Hospital Ramon y Cajal (HRC, Madrid), Hospital del Mar (HM, Barcelona), and Hospital Parc Tauli (HPT, Sabadell).

Participants

Participants were healthcare workers (including clinical and non-clinical staff) employed at the participating hospitals who had been diagnosed with COVID-19 between 2020 and 2023. Eligible participants were those with information available on long COVID status and core variables, including age, sex, and occupational group. Records lacking information on long COVID status or any of the core variables were excluded.

Data collection

Data sources and case ascertainment methods varied across hospitals according to the availability of institutional records. Two hospitals (HRC and HM) maintained registries of clinically diagnosed long COVID cases among workers with prior COVID-19 infection. In HPT, long COVID cases were identified indirectly using prolonged COVID-19-related sickness absence as a proxy measure.

Case definition and variables

The definition of long COVID was guided by the WHO, referring to symptoms persisting for at least two months and usually three months after acute SARS-CoV-2 infection. Given differences in data sources, the operational definition of long COVID varied by hospital (table 1).

The primary outcome was long COVID status (yes/no). The main exposure variable was occupational group, categorised as physicians, nurses, nurse assistants, other HCWs with direct patient contact (e.g. physiotherapists, speech therapists), and non-clinical

staff (administrative and maintenance workers). Age (continuous, in years) was included as adjustment variable, and analyses were stratified by sex.

Statistical analysis

Prevalence of long COVID and 95% confidence intervals (95% CI) were estimated by sociodemographic and occupational variables and stratified by sex using hospital registry data. Confidence intervals for prevalence estimates were calculated using Wilson's method.

Effect modification by sex was evaluated by including an interaction term between sex and occupational category, adjusting for age and hospital in models combining data from multiple centres. As evidence of effect modification was observed, sex-stratified Poisson regression models were subsequently fitted.

Due to heterogeneity in long COVID case definitions across centres, primary regression analyses were conducted separately for each hospital. In analyses with sparse data or separation issues, bias-reduced Poisson regression was applied to obtain stable estimates.

Prevalence ratios (PRs) with 95% confidence intervals (CIs) were obtained by exponentiating model coefficients. Statistical significance was defined as $p < 0.05$. All analyses were conducted using RStudio version 2024.04.2+764.

Ethics approval and consent to participate

This study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of Hospital del Mar (reference HM 2022/10544), the Ethics Committee of Consorci Corporació Sanitària Parc Taulí (reference 2023/6063), and the Ethics Committee of Hospital Universitario Ramón y Cajal (reference 177/23). Clinical trial number: Not applicable.

The data used in this study were anonymised prior to analysis. Given the retrospective nature of the study and the use of routinely collected registry data, the requirement for informed consent was waived by the respective ethics committees.

Results

Registry data included 8,439 HCWs across three hospitals (Table 2). Overall prevalence of long COVID ranged from 3.0% at HPT to 4.9% at HM and 5.0% at HRC. Among women, prevalence was 5.9% in HM, 5.5% in HRC, and 2.9% in HPT. Among men, prevalence was 1.6%, 4.0%, and 3.4%, respectively. Across hospitals, prevalence increased with age in both sexes, with the highest values generally observed among HCWs aged >50 years.

Occupational patterns also varied by centre and sex. In HM, prevalence among women was highest in support staff (10.2%; 95% CI 6.0–16.8) and nurse assistant (7.7%; 95%CI 5.2–11.3), whereas among men most occupational estimates were imprecise due to small numbers. In HRC, prevalence among women was relatively high nurse assistants (6.1%; 95%CI 4.5–8.2) followed by nurses (5.9%; 95% CI 4.6–7.5), and among men the highest estimates were observed in other HCWs (8.3%; 95%CI 2.9–21.8) and nurses (7.4%; 95%CI 4.0–13.1). In HPT, higher prevalence was observed among nurse assistants in both sexes (women 5.1%; 95%CI 3.7–7.0, men 6.5%; 95%CI 3.5–11.6) and among male support staff (5.5%; 95% CI 2.7–11.0).

In sex-stratified Poisson regression models fitted separately for each hospital (Table 3), age was consistently associated with a higher prevalence of long COVID in both females and males. The increase in prevalence per additional year of age ranged from 3% to 9%, with the strongest association observed among males at HPT (PR = 1.09; 95% CI 1.05–1.13).

Among women, adjusted occupational associations varied by hospital. In HM, all occupations showed significantly higher adjusted prevalence ratios compared with physicians, although confidence intervals were wide. In contrast, in HRC no statistically significant occupational differences were observed among women after adjustment for age. In HPT, women nurse assistants showed a significantly higher adjusted prevalence of long COVID compared with physicians (PR 2.97; 95% CI 1.29–6.86), whereas no significant associations were observed for other occupational groups.

Among men, occupational differences were more pronounced, particularly in HRC and HPT. In HRC, nurses (PR = 2.56; 95% CI 1.13–5.81) and other HCWs (PR = 3.67; 95% CI 1.12–12.08) had a significantly higher prevalence of long COVID compared with physicians. In HPT, markedly elevated prevalence ratios were observed among nurse assistants (PR = 20.33; 95% CI 3.64–113.42) and support staff (PR = 8.30; 95% CI 1.46–47.19), although estimates were imprecise. In HM, regression estimates among men were unstable due to very small numbers of long COVID cases in several occupational strata and should therefore be interpreted with caution.

Bias-reduced Poisson regression was applied to account for sparse data and potential separation. Despite wide confidence intervals in some hospital- and sex-specific strata, the results consistently indicate heterogeneity in long COVID prevalence by occupational role and sex, with stronger and more consistent occupational associations observed among men.

Discussion

In this multicentre study among Spanish healthcare workers (HCWs), the prevalence of long COVID identified through hospital registry data ranged from 3% to 5%. Increasing

age was consistently associated with a higher prevalence of long COVID, while overall sex differences were modest after adjustment. Occupational category was associated with long COVID prevalence, with patterns differing by sex and hospital.

The prevalence of long COVID observed in this study was lower than that reported in many previous studies of HCWs, where estimates have ranged widely from 15% to over 70%(10–23). This heterogeneity across studies likely reflects differences in case definitions, diagnostic practices, study periods, and data sources (5,6). Similar, in our study, heterogeneity in long COVID prevalence was observed across hospitals, especially between clinically diagnosed long COVID hospital data (HM and HRC) and suspected long COVID cases (HPT). This variability highlights the importance of using comparable, clinically based definitions in analytical models to centres applying harmonised diagnostic criteria.

Age was positively associated with long COVID prevalence in both women and men. In adjusted analyses, each additional year of age was associated with a 3–9% increase in prevalence, consistent with previous findings in HCWs and in the general population(15,25,26,29). This association may reflect higher comorbidity burden, age-related vulnerability to prolonged recovery, or differences in clinical recognition of long COVID among older individuals (14,25).

Women showed slightly higher crude prevalence of long COVID, but this difference diminished after adjusting for age. This pattern aligns with some previous studies, although findings on sex differences have been inconsistent or heterogeneous (14,15,18,19,21,23,25,28–32). Importantly, sex remained a relevant effect modifier in occupational analyses, indicating that the relationship between job role and long COVID prevalence differs between women and men.

Occupational differences in long COVID prevalence were more pronounced among men. Compared with physicians, certain male occupational groups, particularly nurses and other HCWs, showed higher adjusted prevalence ratios in some hospitals, whereas among women occupational associations were weaker and less consistent after adjustment. These patterns may reflect differences in exposure intensity, task allocation, duration of patient contact, physical workload, and working conditions. Such differences in occupational exposures within the same job categories may vary by sex, reflecting gendered divisions of labour in healthcare settings (11,18,19,33). In addition, sex-related differences in symptom recognition, healthcare-seeking behaviour, and diagnostic practices may contribute to the observed patterns. Although the number of men in some occupational groups was limited and estimates were imprecise, these findings highlight the importance of incorporating gender-sensitive and intersectional perspectives in occupational health research.

The elevated prevalence observed among support staff in some hospital- and sex-specific analyses, although not consistently statistically significant after adjustment,

suggests that non-clinical occupational exposures may also contribute to long COVID risk and warrants further investigation (28,33).

Our findings are consistent with recent evidence from the population-based COVICAT cohort in Spain, which identified several occupational determinants of long COVID, including close interpersonal contact, limited social distancing and inadequate use of protective equipment at the workplace(28), all present in HCWs and non-clinical staff.

Finally, differences in long COVID prevalence and occupational associations across hospitals may partly reflect heterogeneity in case identification, with clinically diagnosed cases in two centres and suspected cases in one centre. Residual heterogeneity related to unmeasured temporal factors, diagnostic practices, and healthcare access cannot be excluded. Future studies using harmonised clinical definitions, standardised data collection, and longitudinal designs are needed to better characterise occupational and sex-specific patterns of long COVID among HCWs.

Strengths and limitations

A major strength of this study is its multicentre design, based on hospital registry data from three large Spanish hospitals, which increases the robustness of the findings and allows the inclusion of HCWs from a wide range of clinical and non-clinical occupational groups. The use of routinely collected registry data reduces recall bias and enables the identification of clinically diagnosed long COVID cases within real-world occupational health settings.

Several limitations should also be considered. First, the lack of individual-level information on the timing of acute COVID-19 infection and long COVID diagnosis precluded adjustment for calendar time, pandemic waves, vaccination rollout, or dominant viral variants. Given the substantial changes in diagnostic practices and long COVID risk over time, this represents an important source of potential residual confounding. To mitigate this limitation, all main analyses were restricted to registry-based data and for each hospital, and centre-specific prevalence estimates were reported.

Second, heterogeneity in case ascertainment and registry periods across hospitals may have affected comparability of prevalence estimates. In one centre, long COVID cases were inferred indirectly from prolonged COVID-related sick leave, which may have resulted in some misclassification and under- or overestimation of prevalence. Third, registry data did not systematically capture relevant individual-level factors such as pre-existing comorbidities, reinfections, infection severity, or vaccination status, limiting the ability to explore underlying mechanisms and residual confounding.

Despite these limitations, the study provides valuable insights into occupational and sex-specific patterns of clinically diagnosed long COVID among HCWs and highlights the need for harmonised data collection and longitudinal follow-up in future research.

Implications

The prevalence observed in this study indicates that a non-negligible proportion of the healthcare workforce may experience prolonged health consequences following SARS-CoV-2 infection. Given the high occupational exposure experienced by HCWs during the COVID-19 pandemic, it is plausible that a proportion of these infections occurred in the workplace, although this cannot be formally assessed with the available data.

From an occupational health perspective, these findings highlight the relevance of considering long COVID within occupational health surveillance frameworks for HCWs, particularly in hospital environments with sustained exposure risk. In Spain, long COVID is not currently recognised as an occupational disease, which may have implications for access to compensation, workplace accommodations, and long-term follow-up within occupational health systems.

In this context, our results highlight the importance of strengthening occupational health monitoring and follow-up strategies for both clinical and non-clinical hospital workers. The observed differences by occupational role and sex suggest that prevention and follow-up approaches should consider the diversity of job tasks and working conditions within hospital settings. Future research should incorporate detailed information on infection severity, reinfections, vaccination history, and workplace exposure patterns to better understand individual and job-level determinants of long COVID among HCWs.

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339 **Competing Interest**

340 There are competing interest declared by any author.

341 **Authors contribution**

342 Pia Delano conceived the study, conducted data harmonisation and statistical analysis,
343 and led the drafting and finalisation of the manuscript. Fernando G. Benavides and
344 Alejandra Vives conceived the study, contributed to the development of the research
345 concept and critically reviewed the results and manuscript drafts. Consol Serra, José
346 María Ramada, M^a Teresa Gea Velázquez de Castro, Roberto Botella Mira, Itria G.
347 Mirabella, Marina Fernandez Escribano, Magdalena Blasco López, Alfonso Muriel,
348 Gemma Navarro, Rosa Serrano, and Claudia Palma-Vasquez were responsible for
349 submitting study protocols to their respective hospital ethics committees and collecting
350 local data. Mireia Utzet Sadurni co-developed the research idea, supervised data
351 analysis, and critically revised all versions of the manuscript. All authors read and
352 approved the final manuscript.

353 **Data sharing statement**

354 The datasets supporting the conclusions of this article, along with the statistical code,
355 are available upon request to the corresponding author.

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491 **Table 1. Definitions and data source of participating hospitals.**

Hospital	Location	Long COVID definition adaptation	Registry years	Source
Ramon y Cajal	Madrid	Diagnosed cases. Symptom persistence after 3 months Lasting for at least 2 months Not related to another cause	2020-2023	Record of long COVID and COVID-19 cases.
Mar	Barcelona	Diagnosed cases. Symptom persistence after 3 months Lasting for at least 2 months Not related to another cause	2020-2022	Record of long COVID and COVID-19 cases.
Parc Tauli	Barcelona	Suspected cases. Based on time of leave of work after COVID-19 infection: lasting for at least 2 months. Not related to another cause	2020-2023	Records of COVID-19 cases with time of leave of work.

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494 **Table 2. Prevalence of long COVID among healthcare workers by hospital, sex, age group and occupational category**

Characteristic	Sex	Hospital del Mar (Barcelona)			Hospital Ramón y Cajal (Madrid)			Hospital Parc Tauli (Sabadell)		
		COVID-19 N	Long COVID n	Prevalence % (95% CI)	COVID-19 N	Long COVID n	Prevalence % (95% CI)	COVID-19 N	Long COVID n	Prevalence % (95% CI)
Sex	Women	1,051	62	5.9 (4.6–7.5)	2,780	153	5.5 (4.7–6.4)	2,642	77	2.9 (2.3–3.7)
	Men	320	5	1.6 (0.7–3.6)	817	33	4.0 (2.9–5.6)	685	23	3.4 (2.2–5.0)
Age group (years)										
<30	Women	340	9	2.6 (1.4–5.0)	608	12	2.0 (1.1–3.4)	574	0	0.0 (0.0–0.7)
	Men	108	0	0.0 (0.0–3.4)	235	9	3.8 (2.0–7.2)	131	0	0.0 (0.0–2.9)
31–50	Women	470	27	5.7 (4.0–8.2)	1,348	83	6.2 (5.0–7.6)	1,355	40	3.0 (2.2–4.0)
	Men	143	3	2.1 (0.7–6.0)	382	9	2.4 (1.2–4.4)	364	10	2.7 (1.5–4.9)
>50	Women	241	26	10.8 (7.5–15.3)	805	58	7.2 (5.6–9.2)	713	37	5.2 (3.8–7.1)
	Men	69	2	2.9 (0.8–10.0)	251	15	6.0 (3.7–9.6)	190	13	6.8 (4.0–11.4)
Occupational group										
Physician	Women	182	1	0.5 (0.1–3.0)	558	27	4.8 (3.3–6.9)	392	6	1.5 (0.7–3.3)
	Men	91	0	0.0 (0.0–4.0)	371	13	3.5 (2.0–5.9)	219	1	0.5 (0.1–2.5)
Nurse	Women	383	22	5.7 (3.8–8.5)	985	58	5.9 (4.6–7.5)	754	19	2.5 (1.6–3.9)
	Men	62	0	0.0 (0.0–5.8)	136	10	7.4 (4.0–13.1)	123	4	3.3 (1.3–8.1)
Nurse assistant	Women	311	24	7.7 (5.2–11.3)	658	40	6.1 (4.5–8.2)	687	35	5.1 (3.7–7.0)
	Men	86	3	3.5 (1.2–9.8)	68	3	4.4 (1.5–12.1)	155	10	6.5 (3.5–11.6)
Other HCW	Women	32	2	6.3 (1.7–20.2)	158	5	3.2 (1.4–7.1)	335	6	1.8 (0.8–3.9)
	Men	15	1	6.7 (1.2–29.8)	36	3	8.3 (2.9–21.8)	60	1	1.7 (0.3–8.9)
Support staff	Women	127	13	10.2 (6.0–16.8)	421	23	5.5 (3.7–8.1)	474	11	2.3 (1.3–4.1)
	Men	59	1	1.7 (0.3–9.0)	263	4	1.5 (0.6–3.8)	128	7	5.5 (2.7–11.0)
TOTAL		1371	67	4.9 (3.9–6.1)	3743	186	5.0 (4.4–5.8)	3325	100	3.0 (2.4–3.6)

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496 **Table 3. Adjusted Sex-stratified Poisson regression models for long COVID prevalence in Healthcare Workers (HCW) for each**
497 **hospital: Hospital del Mar (HM), University Hospital Ramon y Cajal (HRC) y Hospital Parc Tauli (HPT)**

Sex	Category	Hospital del Mar				University Hospital Ramon y Cajal				Hospital Parc Tauli			
		Crude PR (95% CI)	p-value	Adjusted PR (95% CI)	p-value	Crude PR (95% CI)	p-value	Adjusted PR (95% CI)	p-value	Crude PR (95% CI)	p-value	Adjusted PR (95% CI)	p-value
Female	Age (Per year)	1.04 (1.02–1.06)	<0.001	1.03 (1.01–1.05)	0.0035	1.03 (1.01–1.04)	<0.001	1.03 (1.02–1.04)	<0.001	1.05 (1.03–1.07)	<0.001	1.05 (1.03–1.07)	<0.001
	Physician	(Reference)		(Reference)		(Reference)		(Reference)		(Reference)		(Reference)	
	Nurse	7.13 (1.37–37.22)	0.020	6.78 (1.30–35.24)	0.023	1.21 (0.77–1.90)	0.420	1.16 (0.74–1.83)	0.515	1.56 (0.64–3.79)	0.326	1.40 (0.58–3.41)	0.452
	Nurse assistant	9.56 (1.84–49.70)	0.007	8.42 (1.62–43.68)	0.011	1.25 (0.77–2.03)	0.368	1.07 (0.66–1.74)	0.787	3.12 (1.35–7.19)	0.008	2.97 (1.29–6.86)	0.011
	Other HCW	9.48 (1.25–71.76)	0.029	8.76 (1.16–65.92)	0.035	0.71 (0.28–1.76)	0.457	0.58 (0.23–1.46)	0.248	1.17 (0.39–3.47)	0.777	1.07 (0.36–3.18)	0.897
	Support staff	12.90 (2.39–69.68)	0.003	10.08 (1.86–54.65)	0.007	1.13 (0.65–1.96)	0.658	0.79 (0.45–1.40)	0.420	1.46 (0.56–3.83)	0.438	1.00 (0.38–2.64)	0.997
Male	Age (Per year)	1.07 (1.00–1.14)	0.043	1.07 (1.01–1.14)	0.020	1.02 (0.99–1.05)	0.190	1.03 (1.01–1.06)	0.014	1.07 (1.03–1.10)	<0.001	1.09 (1.05–1.13)	<0.001
	Physician	(Reference)		(Reference)		(Reference)		(Reference)		(Reference)		(Reference)	
	Nurse	1.47 (0.03–73.97)	0.848	1.96 (0.04–87.91)	0.729	2.12 (0.95–4.75)	0.068	2.56 (1.13–5.81)	0.025	5.34 (0.84–33.90)	0.076	7.66 (1.22–48.20)	0.030
	Nurse assistant	7.41 (0.38–143.40)	0.185	9.36 (0.53–164.08)	0.126	1.41 (0.44–4.58)	0.563	1.55 (0.48–4.99)	0.463	9.89 (1.79–54.73)	0.009	20.33 (3.64–113.42)	<0.001
	Other HCW	18.20 (0.74–446.76)	0.076	20.10 (0.91–445.11)	0.058	2.67 (0.82–8.66)	0.101	3.67 (1.12–12.08)	0.032	3.65 (0.38–35.09)	0.262	7.23 (0.75–69.22)	0.086
	Support staff	4.63 (0.19–113.58)	0.348	4.57 (0.21–100.21)	0.335	0.47 (0.16–1.37)	0.166	0.41 (0.14–1.20)	0.105	8.55 (1.48–49.38)	0.016	8.30 (1.46–47.19)	0.017

498 Note: PR: prevalence ratio; CI: confidence interval. Adjusted models include age and occupation. Prevalence ratios were estimated using bias-
499 reduced Poisson regression with log link.

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